

WHAT IS CLAIMED IS:

1) A system for analyzing samples comprising:

a) a portable analysis unit comprising:

5 i) a sample inlet

ii) an analyzer for determining a characteristic of a sample and providing data about the characteristic;

iii) a reagent supply reservoir;

10 iv) a collection reservoir for waste comprising used reagent and analyzed sample;

v) a reagent inlet for providing reagent to the supply reservoir;

vi) a waste outlet for removing waste from the collection reservoir;

15 vii) a supply conduit from the reagent supply reservoir to the analyzer;

viii) a waste conduit from the analyzer to the collection reservoir;

ix) a power source for providing power to the analyzer;

20 x) a data output element for outputting data generated by the analyzer;

xi) a pressure source for moving reagent and waste; and

b) a base unit adapted for connection to the analyzer unit for providing reagent to the analysis unit and receiving waste from the collection reservoir, the base unit comprising:

25 i) a reagent storage reservoir;

ii) a waste storage reservoir;

iii) a waste inlet for connection to the waste outlet of the analysis unit for receiving waste from the analysis unit;

30 and

iv) a reagent outlet for providing reagent from the reagent storage reservoir to the reagent inlet of the analysis unit.

5 2) The system for analyzing sample of claim 1 wherein the portable analysis unit further comprises a multiport valve coupled to the pressure source, the supply conduit and the waste conduit.

10 3) The system for analyzing sample of claim 2 wherein the portable analysis unit further comprises a reaction chamber coupled to the multiport valve.

4) The system for analyzing sample of claim 2 wherein:

15 the analysis unit further comprises:

 a wash fluid supply reservoir coupled to the multiport valve; and

 a wash fluid inlet for providing wash fluid to the wash fluid supply reservoir; and

20 the base unit further comprises:

 a wash fluid storage reservoir; and

 a wash fluid outlet for providing wash fluid from the wash fluid storage reservoir to the wash fluid inlet of the analysis unit.

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5) The system for analyzing sample of claim 2 wherein:

 the analysis unit further comprises:

 a support fluid supply reservoir coupled to the multiport valve; and

30 a support fluid inlet for providing support fluid to

the support fluid supply reservoir; and

the base unit further comprises:

a support fluid storage reservoir; and

5 a support fluid outlet for providing support fluid
from the support fluid storage reservoir to the support fluid
inlet of the analysis unit.

6) The system for analyzing sample of claim 2 wherein the
portable analysis unit further comprises a controller
10 controlling the analyzer and the multiport valve.

7) The system for analyzing sample of claim 6 wherein the
controller comprises a microcomputer capable of inputting data
and outputting data.
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8) The system for analyzing sample of claim 7 wherein the
analysis unit further comprises a user input device for
inputting data into the analysis unit microcomputer.

20 9) The system for analyzing sample of claim 6 wherein the
controller contains a set of instructions for directing the
automatic self-cleaning of the analysis unit.

10) The system for analyzing sample of claim 6 wherein the
25 controller contains a set of instructions for directing the
automatic self-calibrating of the analysis unit.

11) The system for analyzing sample of claim 6 wherein the
controller contains a set of instructions for directing the
30 automatic self-replenishing of reagents in the reagent supply

reservoir.

12) The system for analyzing sample of claim 6 wherein the controller contains a set of instructions for directing the automatic self-testing of the analysis unit.

13) The system for analyzing sample of claim 1 wherein:
the analysis unit power source comprises a rechargeable battery; and

the base unit further comprises a battery charger connectable to the analysis unit power source.

14) The system for analyzing sample of claim 1 wherein the base unit further comprises a pump for providing reagents from the reagent storage reservoir to the portable analysis unit reagent inlet.

15) The system for analyzing sample of claim 14 wherein the base unit further comprises a controller coupled to the base unit pump.

16) The modular analysis device of claim 15 wherein the base unit further comprises a user input device for inputting data into the base unit controller.

17) The system for analyzing sample of claim 1 wherein:
the portable analysis unit further comprises:

a control sample inlet; and

the base unit further comprises:

a control sample storage reservoir; and

a control sample outlet for providing control sample from the control sample storage reservoir to the control sample inlet.

5 18) The system for analyzing sample of claim 1 wherein the analyzer is a cytometer flow cell.

19) The system for analyzing sample of claim 18 wherein the cytometer flow cell comprises a core stream hydrodynamically
10 focused by a sheath flow.

20) The system for analyzing sample of claim 1 wherein the pressure source is a pump.

15 21) A method for analyzing samples comprising:

a) selecting the portable analysis unit of claim 1;

b) obtaining a sample;

c) entering the sample into the sample inlet; and

d) analyzing the sample using the portable analysis unit of
20 claim 1 to obtain an analysis for the sample.

22) A method for analyzing samples using the system for analyzing sample of claim 1, the method comprising:

a) disposing the base unit and the analysis unit in a
25 connected configuration;

b) transferring a reagent between the base unit reagent outlet and the analysis unit reagent inlet;

c) disposing the base station and the analysis unit in a disconnected configuration;

d) loading a sample into the analysis unit sample inlet; and
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e) processing the sample using the portable analysis device to obtain an analysis for the sample.

23) A modular analyzing device comprising:

5 a) an analysis unit comprising:

i) a reagent supply reservoir;

ii) a reagent inlet for providing reagent to the reagent supply reservoir;

iii) a wash fluid supply reservoir;

10 iv) a wash fluid inlet for providing wash fluid to the wash fluid supply reservoir;

v) a support fluid supply reservoir;

vi) a support fluid inlet for providing support fluid to the support fluid supply reservoir;

15 vii) a waste collection reservoir;

viii) a waste outlet for removing waste from the waste collection reservoir;

ix) a sample inlet;

x) a pressure source;

20 xi) a reaction chamber;

xii) a multiport valve disposed in fluid tight communication with the sample inlet, the supply reservoirs, the pressure source, the reaction chamber and the waste collection reservoir;

25 xiii) an analyzer for determining a characteristic of a sample and providing data about the characteristic, the analyzer being coupled to the reaction chamber; and

xiv) a power source;

b) a base unit comprising:

30 i) a base unit reagent storage reservoir;

ii) a base unit reagent outlet for providing reagent from the reagent storage reservoir to the reagent inlet of the analysis unit;

iii) a base unit wash fluid storage reservoir;

iv) a base unit wash fluid outlet for providing reagent from the wash fluid storage reservoir to the wash fluid inlet of the analysis unit;

v) a base unit control sample storage reservoir;

vi) a base unit control sample outlet for providing control sample from the control sample storage reservoir to the control sample inlet of the analysis unit;

vii) a support fluid storage reservoir;

viii) a support fluid outlet for providing support fluid from the support fluid storage reservoir to the support fluid inlet of the analysis unit;

ix) a waste storage reservoir; and

x) a waste inlet for connection to the waste outlet of the analysis unit for receiving waste from the analysis unit; and

c) a controller comprising: a microcomputer capable of outputting data and a user input device for inputting data into the microcomputer;

wherein the controller has a set of instructions for at least one of: directing the automatic self-cleaning of the analysis unit, directing the automatic self-calibrating of the analysis unit, directing the automatic replenishing of reservoir fluids in the analysis unit, and directing the automatic self-testing of the analysis unit; and

wherein the base unit and the analyzer unit are capable of being alternatively disposed in:

a disconnected configuration wherein the analysis unit

is separate from the base unit; and

5 a connected configuration wherein the reagent outlet
is connected to the reagent inlet, the wash fluid outlet is
connected to the wash fluid inlet, the support fluid outlet is
connected to the support fluid inlet, and the control sample
outlet is connected to the control sample inlet.